

Appendix A

10-cell Bit Patterns and Timing for SSR reading, bucking and boosting

Action	Time	Bit Pattern										Hex Code							
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
Read		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Zero all outputs	600 us	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	1	2803	
Select cell 1	3ms	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	2803	
Settle SSR's		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Read cell 1		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Zero all outputs	600 us	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3006
Select cell 2	3ms	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3006
Settle SSR's		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Read cell 2		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Zero all outputs	600 us	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	280C
Select cell 3	3ms	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	280C
Settle SSR's		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Read cell 3		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Zero all outputs	600 us	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	280C
Select cell 4	3ms	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3018
Settle SSR's		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Read cell 4		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Zero all outputs	600 us	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	2830	
Select cell 5	3ms	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2830
Settle SSR's		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Read cell 5		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Zero all outputs	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3060
Settle after turn off	600 us	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	1	0	3060
Select cell 6		0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	

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Action	Time	Bit Pattern								Hex Code	
		15	14	13	12	11	10	9	8		
Settle SSR's	3 ms										
Read cell 6											

10-cell Bit Patterns and Timing for SSR reading, bucking and boosting

Action	Time	Bit Pattern								Hex Code
		15	14	13	12	11	10	9	8	
Zero all outputs		0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us									
Select cell 7		0	0	1	0	0	0	1	1	0
Settle SSR's	3 ms									28C0
Read cell 7										
Zero all outputs		0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us									
Select cell 8		0	0	1	1	0	0	0	1	0
Settle SSR's	3 ms									3180
Read cell 8										
Zero all outputs		0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us									
Select cell 9		0	0	1	0	1	1	0	0	0
Settle SSR's	3 ms									2B00
Read cell 9										
Zero all outputs		0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us									
Select cell 10		0	0	1	0	1	0	0	0	3600
Settle SSR's	3 ms									
Read cell 10										
Buck										
Zero all outputs		0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us									
Select cell 1		0	1	0	0	1	0	0	0	1
Settle SSR's	3ms									4803
Read cell 1										
Zero all outputs		0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us									
Select cell 2		0	1	0	1	0	0	0	1	1
Settle SSR's	3 ms									5006
Read cell 2										
Zero all outputs		0	0	0	0	0	0	0	0	0000

10-cell Bit Patterns and Timing for SSR reading, bucking and boosting

Action	Time	Bit Pattern										Hex Code				
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Settle after turn off	600 us															
Select cell 3	0	1	0	0	1	0	0	0	0	0	0	0	1	1	0	0
Settle SSR's	3 ms															480C
Read cell 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Zero all outputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us															
Select cell 4	0	1	0	1	0	0	0	0	0	0	0	0	1	1	0	0
Settle SSR's	3 ms															5018
Read cell 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Zero all outputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us															
Select cell 5	0	1	0	0	1	0	0	0	0	0	0	1	1	0	0	0
Settle SSR's	3 ms															4830
Read cell 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Zero all outputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us															
Select cell 6	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0
Settle SSR's	3 ms															5060
Read cell 6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Zero all outputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us															
Select cell 7	0	1	0	0	1	0	0	0	0	1	1	0	0	0	0	0
Settle SSR's	3 ms															48C0
Read cell 7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Zero all outputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us															
Select cell 8	0	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0
Settle SSR's	3 ms															5180
Read cell 8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Zero all outputs	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us															
Select cell 9	0	1	0	0	1	0	1	1	0	0	0	0	0	0	0	0
																4B00

10-cell Bit Patterns and Timing for SSR reading, bucking and boosting

Action	Time	Bit Pattern										Hex Code						
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	
Settle SSR's	3 ms																	
Read cell 9																		
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Settle after turn off	600 us																	
Select cell 10		0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	5600	
Settle SSR's	3 ms																	
Read cell 10																		
Boost																		
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	8803	
Select cell 1																		
Settle SSR's	3ms																	
Read cell 1																		
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1	1	9006
Select cell 2																		
Settle SSR's	3 ms																	
Read cell 2																		
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	1	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	9006
Select cell 3																		
Settle SSR's	3 ms																	
Read cell 3																		
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000	
Settle after turn off	600 us	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	880C
Select cell 4																		
Settle SSR's	3 ms																	
Read cell 4																		
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	8830
Select cell 5																		
Settle SSR's	3 ms																	

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10-cell Bit Patterns and Timing for SSR reading, bucking and boosting

Action	Time	Bit Pattern										Hex Code					
		15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Read cell 5																	
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us																
Select cell 6	1	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	9060
Settle SSR's	3 ms																
Read cell 6																	
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us																
Select cell 7	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	88C0
Settle SSR's	3 ms																
Read cell 7																	
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us																
Select cell 8	1	0	0	1	0	0	0	1	1	1	0	0	0	0	0	0	9180
Settle SSR's	3 ms																
Read cell 8																	
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us																
Select cell 9	1	0	0	0	1	0	1	1	0	0	0	0	0	0	0	0	8B00
Settle SSR's	3 ms																
Read cell 9																	
Zero all outputs		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0000
Settle after turn off	600 us																
Select cell 10	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	9600
Settle SSR's	3 ms																
Read cell 10																	